Claims

1. A gallium nitride-based compound semiconductor device comprising:

a GaN-based light emitting layer formed above a substrate, wherein

the light emitting layer comprises a multilayer quantum well layer in which an InGaN well layer and an AlInGaN barrier layer are layered.

2. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

a compositional ratio of In in the InGaN well layer is 5% or greater and 15% or smaller.

3. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

a compositional ratio of In in the InGaN well layer is 5% or greater and 13% or smaller.

4. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

a thickness of the InGaN well layer is 1 nm or greater and 2 nm or smaller.

5. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

a thickness of the InGaN well layer is 1.3 nm or greater and 1.8 nm or smaller.

6. A gallium nitride-based compound semiconductor device according

to Claim 1, wherein

a compositional ratio of Al in the AlInGaN barrier layer is 14% or greater and 40% or smaller, and

a compositional ratio of In in the AlInGaN barrier layer is 0.1% or greater and 5% or smaller.

7. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

a compositional ratio of Al in the AlInGaN barrier layer is 16% or greater and 40% or smaller, and

a compositional ratio of In in the AlInGaN barrier layer is 0.1% or greater and 3% or smaller.

8. A gallium nitride-based compound semiconductor device according to Claim 1, further comprising:

an AlInGaN buffer layer adjacent to the light emitting layer.

9. A gallium nitride-based compound semiconductor device according to Claim 8, wherein

a compositional ratio of Al in the AlInGaN buffer layer is 0.5% or greater and 40% or smaller, and

a compositional ratio of In in the AlInGaN buffer layer is 0.1% or greater and 5% or smaller.

10. A gallium nitride-based compound semiconductor device according to Claim 8, wherein

a compositional ratio of Al in the AlInGaN buffer layer is 1% or greater and 40% or smaller, and

a compositional ratio of In in the AlInGaN buffer layer is

0.1% or greater and 3% or smaller.

11. A gallium nitride-based compound semiconductor device according to Claim 1, wherein

the InGaN well layer and the AlInGaN barrier layer are formed at a temperature of 750 °C or greater.